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THE PLANT DISEASE REPORTER

Issued By

THE PLANT DISEASE SURVEY

Division of Mycology and Disease Survey

BUREAU OF PLANT INDUSTRY, SOILS, AND AGRICULTURAL ENGINEERING

AGRICULTURAL RESEARCH ADMINISTRATION

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The Plant Disease Reporter is issued as a service to plant pathologists throughout the United States. It contains reports, summaries, observations, and comments submitted voluntarily by qualified observers. These reports often are in the form of suggestions, queries, and opinions, frequently purely tentative, offered for consideration or discussion rather than as matters of established fact. In accepting and publishing this material the Division of Mycology and Disease Survey serves merely as an informational clearing house. It does not assume responsibility for the subject matter.

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THE PLANT DISEASE SURVEY
DIVISION OF MYCOLOGY AND DISEASE SURVEY

Volume 30 February 15, 1946 Number 2

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CHECK LIST REVISION

Freeman Weiss

MEDICAGO (LEGUMINOSAE)

MEDICAGO ARABICA (L.) All., SPOTTED MEDIC or BURCLOVER (1): M. HISPIDA Gaertn., TOOTHED MEDIC or BURCLOVER (2). Annuals, of Europe, established on waste ground, (1) occasional in the Middle Atlantic, Gulf and Pacific Coast States; (2) more frequent and also in the Central States and Southwest, sometimes a weed but of food value to wildlife; also cult. for forage in Calif.

Botrytis cinerea Pers. ex Fr., leaf blight. Calif. (2)
Cercospora zebrina Pass. (C. medicaginis Ell. & Ev.), leaf spot. Fla. (1); Ala., Ga., La., Miss., Tex. (1,2); S.Car. (2)
Colletotrichum trifolii Bain & Essary, southern anthracnose. Fla. (1); Ala., Ga., La., Miss. (1,2); Okla. (2)
Erysiphe polygoni DC., powdery mildew. Calif., Miss. (2)
Heterodera marioni (Cornu) Goodey, root knot. Calif., Ga. (2). Also on M. rigidula in Ga. (1) is reported resistant.
Phymatotrichum omnivorum (Shear) Dug., root rot. Tex. (1,2).
Pseudopeziza medicaginis (Lib.) Sacc., leaf spot. Ga. (1)
Pyrenopeziza medicaginis Fckl., yellow leaf blotch. Calif. (2). See note on nomenclature of this fungus under Medicago sativa.
Pseudoplea medicaginis Miles, leaf spot, also on other parts. Ala., Ga. (1); (2) experimentally infected. See note under M. sativa.
Sclerotinia sclerotiorum (Lib.) DBy., collar rot. Calif. (2)
Stagonospora meliloti (Lasch) Petr., leaf spot. Fla., Ga., Miss. (1) Conidial stage of Leptosphaeria pratensis Sacc. & Briard.
Stemphylium botryosum Wallr., leaf spot. La. (1,2), Miss. (1). Conidial stage of Pleospora herbarum (Pers. ex Fr.) Rab.
Uromyces striatus Schroet. var. medicaginis (Pass.) Arth. (II,III), rust. Calif., La., Tex. (2). O and I on Euphorbia spp. in Europe, not yet found in America.
Urophlyctis alfalfae (Lagh.) Magn., wart. Calif. (2)

MEDICAGO FALCATA L., YELLOW-FLOWERED ALFALFA, SICKLE A. Perennial of Europe, cult. for forage where hardiness is essential and used in breeding to improve this character.

Ascochyta imperfecta Pk., black stem. Kans.
Corynebacterium insidiosum (McCull.) H.L.Jens., bacterial wilt. Kans., Wis. Occurs in experimental plots without inoculation.
Pseudopeziza medicaginis (Lib.) Sacc., leaf spot. Kans., Wis. Occurs in experimental plots without inoculation.
Pyrenopeziza medicaginis Fckl., yellow leaf blotch. Mont.
Stagonospora sp. (? S. meliloti (Lasch) Petr.), leaf spot. Wis.
Uromyces striatus Schroet. var. medicaginis (Pass.) Arth. (II,III),

MEDICAGO (cont.)
rust. S.Dak.
Urophlyctis alfalfae (Lagh.) Magn., wart. Calif.

Mosaic -- unidentified virus. N.Y.

MEDICAGO LUPULINA L., BLACK MEDIC, YELLOW TREFOIL. European annual widely established throughout the U.S. except the far north; of some forage value in the West and furnishes food for wildlife.

Ascochyta imperfecta Pk., black stem. ? Oreg.
Cercospora zebrina Pass., leaf spot. Ind., Mass., N.Y., Tex., Wis.
Colletotrichum trifolii Bain & Essary, southern anthracnose. Ala., Tex.
Peronospora trifoliorum DBy., downy mildew. Iowa.
Phoma sp., stem blight. Utah
Phymatotrichum omnivorum (Shear) Dug., root rot. Tex.
Pseudopeziza medicaginis (Lib.) Sacc., leaf spot. Ga., N.Y., Vt., Wis.
Pseudoplea medicaginis Miles (? P. briosiana (Poll.) Hoehn.), leaf spot. N.Y.
Stagonospora meliloti (Lasch) Petr., leaf spot. N.Y.
Uromyces striatus Schroet. var. medicaginis (Pass.) Arth. (II,III), rust. Mass. to Ala., Tex. and Okla., Calif., Oreg.

Mosaic -- virus (white clover mosaic virus or one of its components, Marmor efficiens and M. repens F. Johnson). Ida., N.Y.
White spot -- physiological, in part caused by excessive or untimely irrigation. Utah.

MEDICAGO SATIVA L., ALFALFA. Perennial, originally of trans-Caucasian and Caspian region, cult. since antiquity for hay and forage; now grown throughout the U.S. as a hay and pasture crop, usually under irrigation in the West. Improved agronomic vars. involve hybridity with M. falcata.

Agrobacterium tumefaciens (E.F.Sm. & Town.) Conn, crown gall. Ala., Ky., Md., Okla., Pa., Va.
Alternaria sp., secondary leaf spot, seed discoloration. Del., Okla., Va.
Aphanomyces euteiches Drechs., root rot. Wis.
(Aplanobacter insidiosum McCull.): Corynebacterium i.
Armillaria mellea Vahl ex Fr., mushroom root rot. Calif.
Ascochyta imperfecta Pk., black stem. General in the Eastern and Central States from Me. to Ky., Okla. and Minn.; occasional in the West (Calif., Ida., Mont., N.Mex., Utah, Wash.). See also Phoma.
(A. medicaginis Bres.): Stagonospora meliloti
Botrytis cinerea Pers. ex Fr., shoot blight. Pa.

MEDICAGO cont.

Cercospora zebrina Pass. (C. medicaginis Ell. & Ev.), black leaf spot. General in the Eastern and Central States from Mass., Mich. and Nebr. to Ala. and Tex.; also in Calif., Utah, and P.R., not reported in Pacific Northwest or northern Plains States.

Colletotrichum spp., especially C. trifolii Bain & Essary, southern anthracnose. N.Y. and Ill. to Ga. and Tex., also Ariz., Calif., N.Mex. and Utah. Also reported and probably not always distinguished from this sp. are: C. destructivum O'Gara and C. graminicolum (Ces.) G.W.Wils. in Ga., Ky., and Ohio.

Corticium praticola Kotila (? Pellicularia filamentosa Pat.) Rogers), root rot, damping off. Mich., Minn., See also Rhizoctonia solani.

C. rolfsii Curzi. See Sclerotium rolfsii.

Corynebacterium insidiosum (McCull.) H.L.Jens., bacterial wilt, root rot, heart rot. General in northern alfalfa districts from Mass. to Ind., Colo. and Wash.; occasional in the South (Ala., Miss.); also in the Southwest (Ariz., N.Mex.) and in Calif.

Cuscuta spp., dodder. Cosmopolitan. The spp. most commonly reported are: C. arvensis Beyrich, Mass. to S.Dak., Calif. and southward; C. epithymum Murr., N.Y. to Ohio and Utah; C. gronovii Willd., N.Y.; C. indecora Choisy, Ohio.

Ditylenchus dipsaci (Kuehn) Filip., stem nematode. Chiefly in the Western States from Nebr. to N.Mex., Calif. and Wash.; also Ill.

Erysiphe polygoni DC., powdery mildew. Mass., Wyo.

Fusarium spp., collar rot, root rot, wilt. Central and Western States except the Pacific Coast. F. oxysporum Schlecht f. medicaginis (Weimer) Snyder & Hansen, reported from Ariz., Calif., Minn., Miss., and Nebr., is the typical cause of wilt. Other spp. reported are F. avenaceum (Fr.) Sacc. in Wis., F. graminearum Schwabe (=Gibberella zeae (Schw.) Petch) in Kans. & Wis.; F. sambucinum Fckl. (? G. pulicaris (Fr.) Sacc.), in Ohio and Wis.; and F. solani (Mart.) App. & Wr. in Ky.

(Gloeosporium medicaginis Ell. & Kell.): Stagonospora meliloti.

(G. morianum Sacc.): Pyrenopeziza medicaginis

Helicobasidium purpureum (Tul.) Pat. (Rhizoctonia crocorum DC. ex Fr.), violet root rot. Widely distributed but infrequent; chiefly present in old stands; authentic records from Ariz., Iowa, Kans., Mich., Mo., Nebr., Okla., Oreg., Tex., Wash.

Heterodera marioni (Cornu) Goodey, root knot. Ariz., Calif., Colo., Nebr., N.J., N.Y., Okla., Tex., Hawaii. Somewhat resistant or tolerant, especially the var. Hairy Peruvian.

Hoplolaimus coronatus Cobb, associated with root rot. Md.

Leptosphaeria pratensis Sacc. & Briard (Stagonospora meliloti (Lasch) Petr.), leaf spot, stem canker, root rot. Calif., Kans., Md., Mo., Mont., Nev., N.Y., Okla., Pa., Utah, Va., Wis.

Macrophomina phaseoli (Maub.) Ashby, charcoal rot. Ill., Okla.

Macrosporium. See Pleospora and Stemphylium.

Neotylenchus obesus Thorne, associated with root rot. Utah.

MEDICAGO cont.

Ophiobolus tenellus (Auers.) Sacc., on stems. Va.

Panagrolaimus subelongatus (Cobb) Thorne, nematode associated with bacterial wilt and collar rot. Ariz., Colo., N.J., Okla., Pa., Utah.

Pellicularia filamentosa (Pat.) Rogers (Rhizoctonia solani Kuehn), root rot, collar rot, damping off. N.J., to Mich. and Okla., Ariz., Calif.

Peronospora trifoliorum DBy. (P. aestivalis Syd.), downy mildew. General, especially in the Western States.

Phoma spp., stem canker, stem cracking, black stem. Identified as P. medicaginis Malb. & Roum. (? Pleospora rehmiana (Staritz) Sacc.) in Colo., Ida., Kans., Ky., Okla., Tex., Wis. and Wyo; as P. anceps Sacc. in Mont.; as P. herbarum West. var. medicaginis Fckl. in Md. and N.Mex.; as P. vulgaris Sacc. in W. Va. By some the American collections are considered assentially identical with Ascochyta imperfecta Pk.

(Phyllosticta medicaginis (Fckl.) Sacc.): Pyrenopeziza m.

Phymatotrichum omnivorum (Shear) Dug., root rot. Ark., Ariz., Calif., Nev., N.Mex., Okla., Tex.

Physarum spp. (P. cinereum Batsch ex Pers., P. vernum Sommerf. ex Fr.), slime-mold patch. Calif., Kans., N.Y., Pa. Occasionally smothering seedlings and small plants.

Placosphaeria medicaginis Tehon, leaf blotch. Ill.

(Pleosphaerulina briosiana Poll.): Pseudoplea b.

P. hyalospora (Ell. & Ev.) Berl. (Pleospora americana Ell. & Ev.), leaf spot. N.J., W.Va.

Pleospora herbarum (Pers. ex Fr.) Rab. (Stemphylium botryosum Wallr.), leaf spot. Me. to Va., Tex. and S.Dak. This has been erroneously reported as Macrosporium sarcinaeforme Cav. (= Stemphylium s. (Cav.) Wiltshire); the alfalfa form is also physiologically different from S. botryosum on clover.

(P. hyalospora Ell. & Ev.): Pleosphaerulina h.

P. rehmiana (Staritz) Sacc. on stems. Ida., Va. Reported to be the ascigerous stage of Phoma medicaginis, but not confirmed.

P. trifolii (Rostr.) Petr. See Pseudoplea briosiana.

Pratylenchus pratensis (DeMan) Filip., root nematode. Colo.

Pseudomonas medicaginis Sackett, bacterial blight. General in the Central and Western States, including the Pacific Coast; occasional in the East (Md., N.Car., Pa.)

Pseudopeziza jonesii Nannf. See Pyrenopeziza medicaginis.

Pseudopeziza medicaginis (Lib.) Sacc., common leaf spot. General.

Pseudoplea briosiana (Poll.) Hoehn. (? P. trifolii (Rostr.) Petr.), brown leaf spot. N.Y. to Ala., Okla., and Minn. Originally described on alfalfa as Pleosphaerulina briosiana, then placed in Pseudoplea, first as indicated above, then as P. trifolii (Rostr.) Petr. A further transfer to Pleospora, as P. trifolii (Rostr.) Petr. has been proposed. Pseudoplea medicaginis Miles, on Medicago arabica, also is considered identical by some.

Pyrenopeziza medicaginis Fckl., yellow leaf blotch. General. The

MEDICAGO cont.

transfer to Pseudopeziza as P. Jonesii Nannf. has been proposed but is not accepted by American specialists.

Pythium spp., root rot damping off. P. debaryanum Hesse identified in Calif., Iowa, Mo.; P. mammilatum Meurs and P. proliferum DBy. in Calif.; P. pulchrum Mind. and P. splendens Braun in Iowa; P. rostratum Butl. and P. ultimum Trow in Calif.; sp. indet. in Kans. and La.

Rhabdospora allantoides (Berk. & Curt.) Sacc., on stems. Pa.

Rhizobium meliloti Dangeard, in root nodules. General in alfalfa soils, naturally or by inoculation.

Rhizoctonia spp., root rot, root and stem canker, ? girdle. Widespread, chiefly in the Central and Western States. For R. crocorum DC. ex Fr. see Helicobasidium purpureum; for R. praticola Kotila see Corticium praticola; for R. solani see Pellicularia filamentosa.

Rosellinia necatrix (Viala) Prill., white root rot. Calif.

Sclerotinia sclerotiorum (Lib.) DBy., collar rot. Calif., Del., Ida., N.Y., Wash.

S. trifoliorum Eriks., root rot, collar rot. General from N.Y. to Ga. and westward to the Pacific Coast;(absent or rare in the far South.) ?

(Sclerotium bataticola Taub.): Macrophomina phaseoli

S. rolfsii Sacc., root rot, southern blight. Ga., La., Miss., Va., Hawaii.

(Sporonema phacidioides Desm.): Pyrenopeziza medicaginis

Stagonospora sp., leaf spot. N.Y. to Ill., Utah, and Mont. Probably mostly S. meliloti (Lasch) Petr. = Leptosphaeria pratensis. Reports of S. carpatica Baeumler in the U.S. appear not to have been based on critical determinations.

(Stemphylium botryosum Wallr.): Pleospora herbarum

Thielaviopsis basicola (Berk. & Br.) Ferr., root rot. Mass., N.J., Tex.

Tylenchus agricola DeMan, associated with root rot. Wyo.

(T. dipsaci (Kuehn) Bast.): Ditylenchus dipsaci

Uromyces striatus Schroet. var. medicaginis (Pass.) Arth. (II,III), rust. General. O and I on Euphorbia spp. in Europe.

Urophlyctis alfalfae (Lagh.) Magn., wart. Chiefly in the West (Mont. to Tex., Calif. and Wash.), especially the Pacific Coast States; occasionally in the East and South (Ala., Ind., Miss.).

Xanthomonas alfalfae (Riker, F.R.Jones & M.C.Davis) Dowson, bacterial leaf and stem spot. Kans., Wis.

Big bud, phyllody -- ? virus, possibly Galla australiensis Holmes (Lycopersicon virus 5 K.M.Sm.) Ida., Oreg., Wash.

Curly top -- virus (Chlorogenus eutetticola Holmes, Ruga verrucosans Carsner & Bennett, Beta virus 1 K.M.Sm.) Calif.

Dwarf -- virus (Medicago virus 3 K.M.Sm.). Ariz., Calif.

Mosaic -- virus (Marmor medicaginis Holmes var. typicum Black & Price). Chiefly in the West from Mont. to Tex., Calif. and Wash.; occasional in the Central States (Ill., Minn., Tenn., Wis.) and

MEDICAGO cont.

East (N.Y., Pa., Va.)

Ring spot --virus (Annulus tabaci Holmes = Marmor annularium McK.) ? Natural infection. Wash.

Witches'-broom -- virus (Chlorogenus medicaginis Holmes, Medicago virus 4 K. M. Sm.). Ariz., Ida., Utah, Wash.

Black stem. See Ascochyta imperfecta and Phoma medicaginis.

Girdle -- cause uncertain but attributed to insect injury (Stictocephala sp. in the Southwest (Ariz., Calif., N. Mex.); similar, perhaps identical, disease reported in Ark., Mo., N.Y.

White spot -- in part physiological, sometimes attributed to excessive or untimely irrigation, or independent of irrigation and probably caused by nutritional deficiency (? potassium or calcium); in part genetic. Chiefly in the West (Ariz., Ida., Mont., N. Mex., Oreg., Utah, Wash.); sometimes, in old stands, in the Central and Eastern States.

Yellowing -- in part leafhopper injury (Empoasca fabae Harris), in part nutritional deficiency (potassium, boron). Eastern and Central States. Yellowing due to sulfur deficiency is also reported in Nebr. and Oreg.

Yellow top (bronze top) -- boron deficiency. Chiefly in the West (Ida., Wash.); occasional in the East (Ind., Ky., N.Y., N. Car., Tenn.)

MELILOTUS (LEGUMINOSAE)

MELILOTUS ALBA Desr., WHITE SWEETCLOVER (1). Biennial of Eurasia, extensively naturalized in the U.S. and cultivated for forage, hay, and soil improvement on various soil types and in a wide range of climatic diversity; furnishes food for wildlife and is an important honey plant. An annual form, M. ALBA var. ANNUA Auths., HUBAM SWEETCLOVER (2), is grown chiefly in the South.

Aphanomyces euteiches Drechs., seedling root rot. Wis.

Ascochyta caulicola Laub. (A. lethalis Ell. & Barth.) stem canker, gooseneck. Ind., Iowa, Kans., Minn., Mo., N.Dak., ? Pa., Wis., ? Wash.

(A. meliloti (Trel.) J. J. Davis): Mycosphaerella lethalis. A. meliloti Trusova (1915) has priority.

(Cercospora davisii Ell. & Ev.): Mycosphaerella davisii.

? C. zebrina Pass., leaf spot. Calif., N.Y. May be C. davisii, formerly considered a synonym but recently shown to be distinct.

Colletotrichum destructivum O'Gara, anthracnose. Ky., Wis.

C. trifolii Bain & Essary, southern anthracnose. Ill., Okla., Tex. (1); Miss., Tex. (2)

Erwinia lathyri (Manns & Taub.) Magrou, streak. Okla.

Fusarium spp., root rot, wilt. Kans., Minn., N. Mex., N. Dak., Tenn.

MELILOTUS cont.

F. solani (Mart.) App. & Wr. var. aduncisporum (Weimer & Horter) Wr. & Reinking, (= F. solani f. phaseoli (Burkh.) Snyder & Hansen) root rot. Calif.

(Gloeosporium caulivorum Kirchn.): Kabatiella caulivora

(G. meliloti Trel.): Mycosphaerella lethalis

G. vexans Atk., on leaves. Ala.

Hendersonia sp., on dying stems. N.Y., Wis.

Heterodera marioni (Cornu) Goodey, root knot. Ala., Tex., Wash. (1); Ariz. (2)

Kabatiella caulivora (Kirchn.) Karak., northern anthracnose. Ill., Kans.

Leptosphaeria sp. on dead stems. N.Y., Ohio, Wis. At least 2 spp. may be concerned; the N.Y. collection tentatively referred to L. viridella (Pk.) Sacc., the Wis. specimen perhaps genetically connected with Stagonospora meliloti Dearn. & House = Hendersonia sp., fide F.R.Jones.

L. pratensis Sacc. & Briard (Stagonospora meliloti (Lasch) Petr.), leaf spot, stem canker. N.Y. and Wis. to N.Mex. and Wash.

Mycosphaerella davisii F.R.Jones (Cercospora davisii Ell. & Ev.), leaf spot. Pa. to Ala., Kans. and Minn.

Mycosphaerella lethalis Stone (Ascochyta meliloti (Trel.) J.J. Davis), black stem. N.Y. to Va., Tex. and N.Dak.

M. linhartiana (Niessl) Petr., on stems. N.J.

Peronospora trifoliorum DBy., downy mildew. Wis. (1,2), Tex. (2)

(Phoma meliloti Allesch.): Leptosphaeria pratensis

Phymatotrichum omnivorum (Shear) Dug., root rot. Ariz., Tex. (1,2)

Phytophthora cactorum (Leb. & Cohn) Schroet., root rot. Wis.

Pleospora kansensis Ell. & Ev., on dead stems. Kans.

Pratylenchus pratensis (DeMan) Filip., root nematode. U.S.

? Pseudopeziza medicaginis (Lib.) Sacc., leaf spot. Ill., Miss., N.Dak., W.Va., Wis. The form on Melilotus should probably be designated P. meliloti Syd.; it has been shown to be distinct pathogenically and culturally.

Pythium sp., root rot. Ill., Iowa., Ky., Ohio, Wash.

Ramularia sp. (? meliloti Ell. & Ev., ? Stagonospora, ? Cercospora), leaf spot. N.Y.

Rhizobium meliloti Dangeard, in root nodules. General.

Rhizoctonia solani Kuehn, stem rot. Occasional from Mass. to Ala., Tex. and Wash.

Sclerotinia minor Jagger, collar rot. Minn.

? S. sclerotiorum (Lib.) DBy., collar rot. Calif., Mont.

S. trifoliorum Eriks., root and stem rot. Calif., Oreg., and Wash.; Ky., Va., W.Va.

Sclerotium rolfsii Sacc., southern blight. Tex.

(Stagonospora meliloti (Lasch) Petr.): Leptosphaeria pratensis. This antedates S. meliloti Dearn & House (= Hendersonia sp., fide F.R.Jones). Reports of S. carpatica Baeumler in the U.S. appear to be unfounded.

Stemphylium sp. (? S. botryosum Wallr. = Pleospora herbarum (Pers. ex Fr.) Rab.), leaf spot. Mo., ? N.Y. S. sarcinaeforme (Cav.) Wiltshire has been reported on this host in Wash.

MELILOTUS cont.

Mosaic -- virus. Widespread. Several viruses may be involved but most frequently the yellow bean mosaic virus (Phaseolus virus 2 K.M.Sm.), also reported as sweetclover mosaic virus. Other viruses infectious to but not differentiated in this host are: Marmor medicaginis Holmes (Medicago virus 1 K.M.Sm.), M. leguminosarum Holmes (Pisum virus 2 K.M.Sm.), M. trifolii Holmes, M. efficiens F. Johns. and M. repens F. Johns.

Ring spot -- virus (? special strain of Marmor annularium McK., Nicotiana virus 12 K.M.Sm.). Mont., Va.

Streak -- virus (Annulus orae Holmes, Nicotiana virus 8 K.M.Sm.). Ky. and probably elsewhere.

Girdle -- cause unknown, attributed to insects. Ariz., N.Y.

White spot -- physiological, attributed to excessive soil moisture or nutrient deficiency. Utah.

MELILOTUS INDICA (L.) All., ANNUAL YELLOW SWEETCLOVER. Annual of Eurasia, established in waste ground on the Atlantic and Gulf Coasts and especially in the Southwest; grown as a winter cover-crop in Calif.

Ascochyta sp. (? Mycosphaerella lathalis), stem rot. La.

Cercospora zebrina Pass. (? C. davisii Ell. & Ev.), leaf spot. Calif.

Colletotrichum trifolii Bain & Essary, anthracnose. La., Tex.

Entyloma meliloti McAlp., white smut. Ala., Ariz., Calif., La., S.Car., Tex.

Erysiphe polygoni DC., powdery mildew. Calif.

Heterodera marioni (Cornu) Goodey, root knot. Fla.

Leptosphaeria pratensis Sacc. & Briard (Stagonospora meliloti (Lasch) Petr.), leaf and stem spot. W.Va.

Mycosphaerella lethalis Stone, black stem. La.

Phymatotrichum omnivorum (Shear) Dug., root rot. Tex.

Pythium sp., seedling blight. Iowa.

Ramularia meliloti Ell. & Ev., leaf spot. Calif.

Rhizoctonia sp. (? solani Kuehn), root rot. La.

Sclerotinia sclerotiorum (Lib.) DBy., stem rot. Calif.

Sclerotium rolfsii Sacc., southern blight. Tex.

Mosaic -- unidentified virus. La. Enation mosaic (Marmor pisi Holmes) (?) Calif.

Girdle -- cause unknown, perhaps insect injury. Ariz.

MELILOTUS OFFICINALIS (L.) Lam., YELLOW SWEETCLOVER. Biennial of Europe, widely established in the U.S. and grown for forage and hay; an important honey plant.

Ascochyta caulicola Laub., stem canker. Mont., Pa., ? Okla.

Cercospora zebrina Pass. (? C. davisii Ell. & Ev.), leaf spot.

MELILOTUS cont.

N.Y. See note under M. alba.
Entyloma meliloti McAlp., white smut. La.
Leptosphaeria pratensis Sacc. & Briard, leaf and stem spot. Mont., Wis.
Mycosphaerella davisii F.R.Jones, leaf spot. Iowa, Okla., Wis.
M. lethalis Stone, black stem. Iowa, N.J., N.Y.
Peronospora trifoliorum DBy., downy mildew. Ida., Mont.
Phoma medicaginis Malb. & Roum. (? Pleospora rehmiana (Staritz) Sacc.), black stem. Ida.
Phymatotrichum omnivorum (Shear) Dug., root rot. Tex.
Sclerotinia sclerotiorum (Lib.) DBy., stem rot. Mont.

Mosaic -- virus (commonly yellow bean mosaic virus, Phaseolus virus 2 K.M.Sm.), Md., N.Y., Va.
Ring spot -- virus (? Marmor annularium McK., Nicotiana virus 12 K.M.Sm). Mont., Va.

Girdle -- cause unknown, attributed to insects. Ariz., N.Y.

ORNITHOPUS (LEGUMINOSAE)

ORNITHOPUS SATIVUS Brot., SERRADELLA. European annual, grown there for forage and soil improvement, introduced for trial but scarcely cult. in the U.S.

Heterodera marioni (Cornu) Goodey, root knot. Fla., S.Car.
Rhizoctonia solani Kuehn, root and stem rot.

OXYTROPIS (LEGUMINOSAE)

OXYTROPIS LAMBERTII Pursh, CRAZYWEED (1). Perennial herb of the Western Plains, a cause of stock poisoning (locoism). Other spp. (2) lacking the toxic principle, are of limited forage value.

Erysiphe polygoni DC., powdery mildew. Mont., S.Dak., Wyo. (1)
Phleospora oxytropidis Ell. & Gall., leaf spot. Mont., N.Mex. (1)
Pleospora herbarum (Pers. ex Fr.) Rab., leaf spot. Mont., Alaska (2)
Pyrenophora chrysospora (Niessl.) Sacc., on dead stems. Alaska (2)
Uromyces lapponicus Lagh. (O,I,III), rust. Colo., Wyo. (2)
U. punctatus Schroet. (II,III), rust. N.Dak. and Mont. to Kans. and N.Mex. (1,2). O and I on Euphorbia spp. in Europe.

PETALOSTEMON (LEGUMINOSAE)

PETALOSTEMON spp., PRAIRIE-CLOVER. Annual or perennial herbs

PETALOSTEMON cont.
of prairies and plains in the South and Central States to the Rocky Mountains; of food value to wildlife and sometimes grown for ornament.

Hendersonia petalostemonis Fairm., on stems. N.Mex.
Puccinia andropogonis Schw. var. onobrychidis (Burr.) Arth. (O,I), rust. N.Dak. to Kans., Colo. and Wyo.
Pyrenophora comata (Auers. & Niessl) Sacc., on dead stems. N.Mex.
Uropyxis petalostemonis (Farl.) Det. (O,I,II,III), rust. Wis. to N.Dak., Colo. and N.Mex.

DIVISION OF MYCOLOGY AND DISEASE SURVEY

LEGUME DISEASES PREVIOUSLY UNREPORTED FROM OKLAHOMA

D. A. Preston

A number of plant diseases have been reported from Oklahoma for the first time since the publication of "Host Index of Oklahoma Plant Diseases" as Technical Bulletin No. T-21 of the Oklahoma Agricultural Experiment Station. Several have been reported on leguminous plants, and these are presented here in order to make them readily available.

ASTRAGALUS DAHURICUS DC.
Undetermined Virus, Mosaic, Payne Co.

ASTRAGALUS FALCATUS Lam.
Undetermined Virus, Mosaic, Payne Co.

ASTRAGALUS HAMOSUS L.
Uromyces punctatus Schroet., Rust, Payne Co.
Undetermined Virus, Mosaic, Payne Co.

CROTALARIA ANAGYROIDES H.B.K.
Undetermined Virus, Mosaic, Payne Co.

CROTALARIA MUNDYI Baker
Undetermined Virus, Mosaic, Payne Co.

CROTALARIA SPECTABILIS Roth.
Undetermined Virus, Mosaic, Payne Co.

CROTALARIA STRIATA DC.
Undetermined Virus, Mosaic, Payne Co.

CROTALARIA USARAMOENSIS Baker
Undetermined Virus, Mosaic, Payne Co.

LATHYRUS SYLVESTRIS L.
Ascochyta pisi Lib., Payne Co.
Heterosporium sp., Payne Co.

MELILOTUS OFFICINALIS (L.) Lam.
Phoma sp., McClain Co.

PHASEOLUS AUREUS Roxb.
Erysiphe polygoni DC., Powdery mildew, Carter Co.
Sclerotium rolfsii Sacc., Le Flore Co.

PROSOPIS CHILENSIS (Mol.) Stuntz
Phyllosticta juliflora Ell. & Barth., Payne Co.
Ravenelia arizonica Ell. & Ev., Major Co.

PSORALEA DIGITATA Nutt.
Parodiella perisporioides (B. & C.) Speg., Payne Co.

SOJA MAX (L.) Piper
Phomopsis sojae Lehm. Payne Co.
Phyllosticta glycineum Tehon & Daniels, Payne Co.
Sclerotium rolfsii Sacc., Le Flore Co.

SOPHORA JAPONICA L.
Phyllosticta sophorae Ell. & Ev., Payne Co.

STROPHOSTYLES LEIOSPERMA (T. & G.) Piper
Phyllosticta phaseolina Sacc., Osage Co.
Uromyces phaseoli (Pers.) Wint. var. strophostylis Arth., Osage Co.

STROPHOSTYLES MISSOURIENSIS (Wats.) Small
Uromyces phaseoli (Pers.) Wint. var. strophostylis Arth. Osage Co.

VICIA VILLOSA Roth
Protocoronospora nigricans Atk. & Edg., Payne Co.

DEPARTMENT OF BOTANY & PLANT PATHOLOGY
OKLAHOMA A. & M. COLLEGE, STILLWATER, OKLAHOMA

SEASONAL VARIATIONS IN THE INCIDENCE OF THE LOOSE SMUTS OF WHEAT AND BARLEY IN WEST VIRGINIA

Carlton F. Taylor and J. G. Leach

In a test of an apparatus for the hot water treatment of small grains, two samples each of winter barley and of winter wheat were collected from the 1944 crop. Samples of the seed sown in these fields in 1943

also were available in the case of the winter barley. Replicated plots of the wheat and barley were sown at Morgantown, West Virginia in the fall of 1944. Data on the incidence of loose smuts (Ustilago tritici and Ustilago nuda) in the untreated plots in the spring of 1945 are presented in Table 1.

Table 1. Seasonal variations in the incidence of loose smut of wheat and barley in West Virginia

	Percent loose smut		
	Smut counts, Wardensville, 1944	1943 seed crop grown 1944-45 Morgantown	1944 seed crop grown 1944-45 Morgantown
Barley A	19.8	17.5	11.0
Barley B	6.5	4.3	2.8
Wheat A	7.0	-	3.0
Wheat B	6.5	-	2.7

Further evidence on the lower incidence of the loose smuts of wheat and barley in 1945 was obtained in a demonstration project of the West Virginia Agricultural Extension Service. In this project samples of the small grain seed used by the farmers are collected and seeded in plots at Reymann Memorial Farms, Wardensville, West Virginia. These samples are obtained mostly from six counties in the drainage basin of the South Branch of the Potomac River. By this method a number of varieties of both wheat and barley are sampled.

Samples of barley drawn from 25 farms in 1943 averaged 2.5 percent loose smut in 1945 while an equal number of samples drawn in 1944 averaged 1.5 percent loose smut in 1945. Wheat samples drawn from 41 farms in 1943 averaged 1.5 percent loose smut, while an average of 0.5 percent was obtained in 41 lots drawn in 1944. While these samples are not necessarily from the same farms, the samples were drawn from a restricted area. The number of samples is such as to suggest significance in the lower readings obtained in 1945.

These limited observations suggest that conditions during the spring of 1944 were less favorable to the dissemination of the loose smut of wheat (U. tritici) and of the loose smut of barley (U. nuda) than were the conditions during the spring of 1943. Precise data on the bloom dates of small grains in this area during the two springs are lacking, hence exact comparisons of weather conditions are not possible. General weather conditions during the one-week period during which bloom occurred were not greatly different.

DEPARTMENT OF PLANT PATHOLOGY AND BACTERIOLOGY
WEST VIRGINIA UNIVERSITY

NOTES ON DISEASES OF GARDEN CROPS IN GEORGIA IN 1945

Julian H. Miller

Cucumber Mosaic (virus) was observed on early summer crookneck and straightneck squash in seven Athens gardens and in commercial fields in Peach County with average losses of 50 percent of the plants by early June. In some of the gardens all of the plants died before bearing. A late planting in one of the above gardens showed total infection before any plants had runners. A row of banana squash was not so severely attacked. Cantaloupes and cucumbers in these same gardens showed some symptoms but were not seriously injured. This mosaic is not widespread over the State and was not found in most of the farm gardens inspected.

Rootknot (Heterodera marioni) continues to be the chief disease of Georgia summer crops in home gardens. Beets and carrots that did not mature before June 15 in Clarke County showed long stringy roots with beaded knots. Turnips and Swiss chard were found in four gardens in early June with dwarf pale leaves and knots on roots and about half of the stand died. Tomatoes and okra were most seriously affected. Eggplant and pepper were observed with some knots, but were not completely destroyed as with many of the above plants. Also, lima beans, both running and dwarf sorts, were not reduced much in yield in spite of many knots. The Logan bean was not affected as much as the Greenpod, Bountiful, and Valentine. Of the weeds in these gardens Ambrosia artemisiifolia, Chenopodium album, C. ambrosioides var. anthelminticum, Amaranthus retroflexus, A. spinosus, and Oenothera laciniata, showed no knots, and Acalypha ostryaefolia was the only one found affected. Knots were seen on Bermuda grass in Tift and Cooke Counties, but none was found on the same species in north Georgia gardens, although growing adjacent to heavily infected truck crops.

Potato Diseases. This year Rhizoctonia solani was most serious on commercial plantings in Rabun, Union and Gilmer Counties. Most of the seed stock had not been treated. Late blight (Phytophthora infestans) was seen in Rabun and Union Counties defoliating the plants when the potatoes were less than two inches in diameter. There was hardly a trace of any sort of mosaic (virus) in the fields inspected this year. All plantings were from certified northern stocks.

In two Athens gardens the tubers were left in the ground after the tops had died in July and most of them rotted with either soft rot (Erwinia carotorova) or some Fusarium rot. In one there was an unusual infection of Sclerotium bataticola. The weather was very hot and dry. Each tuber was peppered with small black sunken dots, each surrounded with a soft necrotic area, 1-3 mm in diameter.

In a community garden two lots without dust had about 30 percent of the foliage destroyed by early blight (Alternaria solani) on May 13 and 90 percent by May 26. Another patch nearby dusted 5 times with

tribasic copper showed only a trace even at maturity.

Tomato Diseases. Early blight (Alternaria solani) is always serious during fruiting and on young plants for the second crop sown in July or August. Several gardens used either tribasic copper or compound A as dusts, but did not secure as good results as in 1944. Heavy and frequent rains in middle and late July washed the dust off before it became effective.

Bacterial wilt (Pseudomonas solanacearum) was again more common than Fusarium wilt (Fusarium oxysporum f. lycopersici). In early August about 10 percent of the plants were dead on the Horticulture farm and two half-acre fields in Carroll County were completely destroyed. Most of the gardens inspected in late summer showed anywhere from 5 to 50 percent dead plants. This was due in most cases to a combination of wilt and root knot (Heterodera marioni).

Diseases of Turnips. This summer mosaic (virus) was noticed for the first time. In several gardens 10 to 15 percent of the plants showed chlorotic mottling with no other signs of disease. Pale spot (Cercosporella albo-maculans) was serious in July in turnips grown for greens in Clarke, Barrow and Brooks Counties.

DEPARTMENT OF PLANT PATHOLOGY AND PLANT BREEDING
UNIVERSITY OF GEORGIA

LATE BLIGHT ON TOMATOES ON THE WEST COAST OF FLORIDA

A. L. Harrison

On November 26, 1945 the writer's attention was called to a field of tomatoes in the Sun City area of Florida, in which late blight (Phytophthora infestans) was already well established. It was causing serious defoliation and fruit rotting in large areas of the field. Two days later it was observed in a field of tomatoes about 2 miles south with no cultivated land in between the two fields. New outbreaks 4-5 miles or more away from fields previously observed with late blight were found every few days until by the end of December it was in practically every commercial tomato field in Manatee and Hillsborough counties. Fortunately the bulk of the fall crop had been harvested before the disease had become wide spread and the actual losses were light except in isolated cases.

There is, however, serious danger to the spring tomato crop since planting in seed beds and direct sowing in the field for the spring crop have been made near old tomato fields. Most fields in which late blight was present have been disked or plowed but nevertheless plenty of green tomatoes and plant refuse has been left on the ground to continue to be sources of inoculum for days or even weeks afterward.

The disease has already been observed in some seed beds and will be serious threats to the whole spring tomato acreage.

When late blight was first observed in the Sun City area, the question that naturally arose was, where did the fungus come from? Potatoes are not grown commercially in Manatee and Hillsborough counties in the fall. In only two cases were potatoes found or reported anywhere near tomatoes. These were in home gardens that had not been sprayed and only had occasional leaves showing symptoms of late blight. Why did these potatoes escape serious damage? Did the fungus live on these home garden potatoes without doing any damage until it had hopped over on tomatoes? If not, where did the fungus first come from? The question is still open and will be a hard one to answer.

VEGETABLE CROPS LABORATORY, BRADENTON, FLORIDA

DISEASES OF VEGETABLE CROPS DURING DECEMBER IN PALM BEACH COUNTY, FLORIDA

G. R. Townsend, R. C. Cassell, E. L. Felix,
and Russell Desrosiers

BEANS While bean fields of the coastal area are in all stages of maturity and all probably 100 percent affected with root rots (Rhizoctonia spp. and others), the root rots are not having the telling effects on yields that have been experienced in some past years. Yields are undoubtedly being reduced but the actual wilting of plants while at top production has not been observed by the growers this year, probably because of ample or more than abundant rainfall during the producing season.

Southern wilt (Sclerotium rolfsii), has been found in three fields in the coastal area. Only a few scattered affected plants were found in each case.

Sclerotinia wilt or watery soft rot (S. sclerotiorum), is reliably reported to have appeared in serious proportions in the Pompano area (Broward County) within the last ten days. Fields are said to be almost 20 percent affected with hardly a hamper going to market without some affected pods. Losses from this disease had not occurred in Palm Beach County at the month's end.

There were no serious disease losses to the bean crop remaining in the Everglades during the month. A frost on December 1 destroyed about 50 percent of the late fall acreage.

CABBAGE Black rot (Phytomonas [Xanthomonas] campestris) has been present in all cabbage fields observed during the month. Actual losses have not been high except in a few fields in which the

disease had developed in mature heads. One grower reported a 50 percent loss. None of the seed used for planting the Everglades Crop has been hot-water treated.

CELERY Early blight (Cercospora apii) could be found in all fields but has been brought under better control than in November. In properly sprayed fields there was no loss from this disease.

Mosaic (virus) increased in the crop as it reached maturity. Counts showed as many as 60 percent of the plants affected near weedy borders and ditch banks. Actual losses due to stunting of the plants and discoloration of the petioles have been less than 1 percent of the harvested crop. Aphids have been numerous on celery and weeds in recent weeks, and constitute a potential threat to the mid-season and spring celery.

Pencil-stripe (cause undetermined) has occurred in a few Everglades fields but has caused only slight losses here. On a field trip to Orange County 7 percent of the plants were found to be affected in two fields (35 acres) at Zellwood. As many as 33 percent of the plants were affected in portions of these fields. Since borax had been applied to the soil at the rate of 15 pounds per acre in these fields, the trouble does not seem to be related to boron deficiency.

Brown root rot (cause undetermined) has been very prevalent in the seed beds during December. Practically all plants show the rusty brown root lesions which in severe cases result in yellowing and stunting of the plants. The pathogenicity of fungi isolated from these lesions is being tested.

CUCUMBERS Downy mildew (Pseudoperonospora cubensis), was present on 100 percent of the plants in two fields of the Boca Raton coastal area under observation during the last month. Severity approached 30 percent in both cases in spite of the fact that regular dustings of copper had been applied.

ESCAROLE Hollow heart (cause undetermined) has occurred in one strain of escarole grown in several fields near Belle Glade. The disease is characterized by a brown discoloration and necrosis, resulting in the main root becoming hollow from the crown of the plant downward for some distance. When this occurs the heart leaves fail to develop, and the plant is quite flat. An opening from the crown into the root sometimes permits soft rot to develop.

EGGPLANT Phomopsis blight (P. vexans) appears to be the limiting factor in eggplant production on the coast as far as diseases are concerned. Plants affected with collar rot are easily broken by wind and as affected fruits increase in number the planting is abandoned. This is known to have happened in several fields this winter.

PEPPER Leaf spots caused by Cercospora capsici and Xanthomonas vesicatoria are present in most plantings on the coast. Within the last month Cercospora leaf spot has been the most widespread of the two diseases. No serious losses are known to have occurred from either disease, except for one field in which Cercospora has cut the yield of peppers by at leaf 40 percent.

Mosaic (virus) is present in about 1 percent of the plants of one field and has caused the replacement of about 10 percent of the plants in another field.

POTATOES An early frost on December 1 killed about 50 percent of the fall potato crop. The yield reduction on about 2500 acres affected by the frost will be 50 to 75 bushels per acre. Another 2500 acres were not seriously damaged by the frost.

Late blight (Phytophthora infestans) developed considerably during the month and had killed unsprayed and poorly sprayed potatoes by December 15. Well sprayed fields remained green for two to three weeks after the last application of Dithane or Copper A. Some late blight tuber rot was observed following rains late in the month. Yield reductions of as much as 33 percent have been noted.

Scab (Actinomyces scabies) was less prevalent than in most years. In a few fields the percentage of scabby tubers was high. The Irish Cobbler variety was severely infected in the Station variety trials, while Triumph and Pontiac were only slightly affected, and the Sebago variety was quite clean.

Early blight (Alternaria solani) was prevalent in mature fields but much less destructive than late blight.

SQUASH All squash plantings in production that have been observed on the coast during December have been affected with a "blossom-end" fruit rot which progressively envelops the entire fruit. A trace to about 20 percent affected fruits have been observed in fields of both the Early Yellow Summer Crookneck and the Patty Pan types of squash. Fruit rots caused by Fusarium sp. and Botrytis sp. have been identified in connection with the Patty Pan type but both organisms were considered to be secondary invaders.

TOMATOES What appears to be bacterial spot (Phytomonas [Xanthomonas] vesicatoria), is widely distributed in the coastal area and present in the majority of fields. Positive identification has not been made but macroscopically the disease appears to be bacterial spot and bacterial isolates have been obtained. The disease has been found in fields from Lake Park to Boca Raton. Generally speaking the disease has caused but small loss so far, although affected fruits have averaged 15 percent in one field. Occurrence has been as a leaf spot and as "scab" on the fruits.

Early blight (Alternaria solani), is present in most fields as a leaf spot, but appears to be of minor importance at present.

Fusarium wilt (F. oxysporum f. lycopersici), was found in one field during the past week. It appeared to have affected only about one percent of the plants which constituted a small isolated area of the field. This is the third field in which Fusarium wilt has been observed on the coast this winter.

Late blight (Phytophthora infestans) appeared on a few tomatoes at the Experiment Station about December 15, but the disease has made practically no advance since that time. This is interesting in relation to a destructive outbreak of late blight of potatoes on nearby experimental plots.

EVERGLADES EXPERIMENTAL STATION
January 1, 1946

A NOMENCLATORIAL DISCUSSION OF USTILAGO STRIIFORMIS

John A. Stevenson

It has been noted that some mycologists recently have used the binomial Ustilago linearis (Dozy & Molk.) Cif. rather than the more commonly employed U. striiformis (striaeformis) (West.) Niessl for the fungus causing the common stripe smut of many American grasses. This usage apparently stems from Ciferri who set up the former name as a new combination in his work on the Ustilaginales of Italy (Flora Italica Cryptogama, fasc. 17: 339. 1938). He bases it on "Caeoma lineare Dozy & Molk. Tijdskr. v. Natur. Gesch. en Physiol. 11: 407. 1844."

Upon referring to this latter publication, however, it is found that Dozy and Mokenboer do not describe Caeoma lineare as new, but properly attribute it to Link. Their complete reference to the species is brief and as follows:

"C. lineare Lk. in foliis Holci mollis amphigenum."

Link's treatment of the species (in Willdenow Species Plantarum 6 (2): 4. 1825) is more detailed:

"CAEOMA LINEARE.

C. maculis flavo-fuscis, acervis ellipticis tum elongatis linearibus, epidermide rumpente, sporidiis oblongis flavis.

Uredo linearis. Pers. syn. p. 216. a De Cand. fr. 6. p. 84. Schumach. Saell. 2. p. 230.

Habitat in pagina inferiore et vagina Graminum praesertim Cerealium, quae infestat, totius Europae, in Aegypto invenit Ehrenberg (v. v.).

Diagn. Acervis linearibus et ellipticis dignoscitur nervos sequentibus foliorum.

Not. Non esse Pucciniam Graminis juniore statu De Candolle adserit, et consentio, quamvis saepe junctae reperiuntur plantulae."

It will be noted that Link very definitely describes a fungus with oblong yellow spores on lower leaves and leaf sheaths of grasses, particularly of cereals. Of a certainty this could not apply to the leaf smut under discussion. De Candolle at first (Enc. Bot. 8: 249) considered Uredo linearis as "Puccinia graminis junior", but later (Flore française 5: 84. 1815) changed his mind and pointed out why he considered it different from both Puccinia graminis and P. rubigo-vera (rouille). It is clear, however, that he is discussing a rust at all times and not a black-spored leaf smut. His original surmise was more nearly the correct one. Link (l. c.) notes that De Candolle does not consider C. lineare as a juvenile stage of P. graminis and adds that he agrees, although the two are often found together, "Quamvis saepe junctae reperiuntur plantulae."

Persoon in his Synopsis Methodica Fungorum (p. 216, 1801) which is of course the starting point for the nomenclature of the Ustilaginales, treats of Uredo linearis as "linearis longissima inquinans flava, demum colore obscuriore. Hab. copiose aestate in culmis et foliis Hordei, Avenae, Secalis cerealis etc." Then he adds "Vereor, no junior plantula Pucciniae graminis modo sit". In other words he suspects that this is nothing but a young stage of Puccinia graminis, and there is nothing in his description to prevent such a disposition of U. linearis.

Other workers since Persoon have generally considered this name as applying to a rust, although P. graminis is not always involved.

Schumacher (Enum. Plant. Saell. 2: 230. 1803) describes his Uredo linearis with "peridiis linearibus, subconfluentibus, subelevatis pallidis, pulvere flavo aurantiaco. In foliis Bromi mollis et arvensis." Again clearly not a black spored smut, although possibly one of the brome rusts rather than P. graminis.

Sturm (Deutschlands Flora III, Bändchen 6: 49. Tab. 25. 1862) mentions "sporidiis oblongis flavis" in his description of Caeoma lineare Lk. (Uredo linearis Pers.) and reports it as occurring on leaves and leaf sheaths of "Getreidearten so wie auch anderer Gräser". These notes together with his colored illustrations of an infected wheat culm and the spores themselves leave no doubt but that he was dealing with P. graminis in the uredo stage.

De Toni (Saccardo Syll. Fung. 7: 622. 1888), Sydow (Monographia Uredinearum 1: 694. 1904), and Oudemans (Enum. Syst. Fung. 1: 785. 1919), have all agreed in considering Caeoma or Uredo linearis as synonymous with P. graminis.

It may be further noted that Ciferri (l. c.) ignores completely the earlier history of the name under discussion, which rather clearly belonged to a rust for which the consensus of opinion favors Puccinia graminis. Dozy and Molkenboer in reporting a fungus on Holcus may have had the leaf smut, but if so, applying the name Caeoma lineare Lk. to it was a misdetermination. If Ciferri meant to imply that they were setting up a new species, he is still in error for their name then is a nomen nudum, as well as a later homonym.

Liro (Die Ustilagineen Finnlands in Ann. Acad. Scient. Fennicae, (ser. A.) 17: 62. 1924) disposed of the matter effectively when he says "Ob hierher auch Caeoma lineare Dozy and Molkenboer auf Holcus mollis gehört muss dahingestellt bleiben." In other words whether Caeoma lineare sensu Dozy and Molkenboer belongs in the synonymy of Ustilago striiformis must remain uncertain unless and until their specimen can be seen.

The review given above seems sufficient to indicate clearly that Uredo linearis (Caeoma lineare) has been applied properly to a rust and most probably is a synonym of Puccinia graminis. It cannot by any possible interpretation be considered as applying to the leaf smut. Anyone disposed to insist upon the use of the epithet lineare as applied to the leaf smut fungus throws the case into a situation readily covered by Article 63 of the International Rules of Botanical Nomenclature: "A name of a taxonomic group must be rejected when its application is uncertain (nomen dubium)."

The specific epithet striiformis for the stripe smut fungus was set up by Westendorp (Bull. l'Acad. Roy. Belg. 18: 406. 1852.) and his account of it follows:

"144. Uredo striaeformis Nov. Sp.

Groupes linéaires, parallèles, allongés, nombreux, confluents, noirâtres, s'ouvrant suivant les sens des fibres de la feuille. Sporidies assez grosses, globuleuses, d'un brun foncé.

Au premier aspect, on prendriat cette espèce pour l'U. longissima, offrant comme lui, des pustules linéaires, simulant des stries sur les deux faces de la feuille; mais, dans cette nouvelle espèce, les pustules sont plus étroites, plus foncées de couleur, les sporidies, vues au microscope, quatre fois plus grosses et d'un brun foncé.

Sur les jeunes pousses de L'Holcus lanatus et de l'An-

thoxanthum odoratum, dont il empêche le développement. Environs de Courtrai."

Niessl (Hedwigia 15: 1. 1876) transferred the species to Ustilago with the following brief comment:

> "Die von Westendorp unter Nr. 677 seiner Sammlung ausgegebene und in dem Bullet. Ac. Brux. 1951 p. 406 beschriebene Uredo striaeformis (an Holcus lanatus bei Courtrai im Sommer) ist ganz genau dieselbe, welche in Rabh. f. eur. 1097 unter dem Namen Tilletia de Baryana Fischer v. Waldheim vom Autor selbst ausgegeben und beschrieben wurde. Hier ist das Substrat Holcus mollis. Diese Art ist als Ustilago striaeformis (Westdo.) zu bezeichnen."

The Sydows (Monographia Uredinearum 1: 709. 1904) complicate the situation somewhat by citing Uredo striiformis West. as a synonym of Puccinia dispersa Eriks. & E. Henn. They do not give any reasons for making this disposition of Westendorp's species. It seems strange that they would add this species reported on Holcus to their synonymy of a fungus which they note as occurring only on Secale. Leaf rust on Holcus spp. they refer to P. holcina, but do not report it for Belgium. It is noted also that they include in the synonymy of P. dispersa, Puccinia striiformis West. "proparte" and one can conclude that they tossed in Uredo striiformis without investigation, assuming because of the identical specific name that the same fungus was involved. Westendorp's description (Bull. de l'Acad. de Belg. 21: 235. 1854) of his Puccinia striiformis on "chaumes des cereales" leaves no doubt but that he was dealing with one of the cereal rusts, and it should not be confused in any way with his Uredo striiformis which is just as clearly a leaf smut.

In this connection there may be cited further the disposition of these two epithets by J. Kickx in his Flore Crypt. des Flandres, since Kickx appears to have been interested in and at all times familiar with Westendorp's work. He communicated the latter's fungus papers to the Belgian Academy, and prefaced them with remarks which indicate his familiarity with Westendorp's material. In his flora he includes (vol. 2: 55. 1867) Puccinia striiformis as a cereal rust and places Uredo striiformis (l. c. p. 83) as a synonym of Ustilago macrospora Desm., amplifying the original descriptions somewhat, but basing his descriptions in each case on Westendorp's type collections. His reference of the leaf smut to U. macrospora is erroneous as pointed out by Liro (l.c. p. 380), but this is a matter extraneous to our theme.

Liro (l.c., p. 380) also brings up another point which may complicate the situation. He quotes Niessl (Hedwigia 15: 1. 1876) who says, in effect, that Westendorp's specimen 677 described as Uredo striiformis is the same species as that described and issued by Rabenhorst in his

Fungi Europaei, no. 1097, as Tilletia debaryana. He then adds that the host in the specimen of Rabenhorst's no. 1097 which he has seen is Triticum (Agropyron) repens and not Holcus. Therefore, if Niessl is correct in stating that the same host genus is involved in both Westendorp's and Rabenhorst's specimens, T. (Agropyron) repens is involved rather than Holcus. In that event the specific epithet striiformis would probably have to be applied to the Agropyron stripe smut, Ustilago aculeata (Ule) Liro. However, both specimens of Rabenhorst's no. 1097 in the Mycological Collections of the Bureau of Plant Industry consist of Holcus leaves and not Agropyron, as determined by Mrs. Agnes Chase after careful examination, so that this phase of the problem remains suspended until such time as Westendorp's type is available for study.

Berkeley and Broome (Ann. & Mag. Nat. Hist., (Ser. 2) 5: 463. 1850) described as a new species Ustilago salvei, forming elongated parallel black sori on the upper surface of leaves of Dactylis glomerata collected by the Rev. T. Salwey in Guernsey. De Toni (Sacc. Syll. Fung. 7: 485. 1888) considered this a synonym of Tilletia striiformis. Liro (Die Ustilagineen Finnlands, I, p. 75-76. 1922) used the name for a smut on Dactylis glomerata which he considered distinct from U. striiformis on Holcus and other grasses. He also cited some dozen other workers who employed the name in the same way. The type specimen in the Berkeley Herbarium at Kew has been recently examined by Dr. G. C. Ainsworth who finds that the host is apparently Holcus lanatus (fide C. E. Hubbard) and that the fungus agrees with U. striiformis. On a basis of strict priority the Berkeley and Broome epithet would appear to supersede any claims striiformis might have in spite of the fact that many mycologists, who have written on the subject, have followed De Toni in placing salvei in the synonymy of striiformis.

It would be most unfortunate to attempt at this time, however, to substitute the relatively little-known and generally misapplied epithet salvei for the almost universally used and descriptive striiformis. Therefore in view of the various errors that have been made in the use of salvei, this epithet will be considered a nomen ambiguum under the provisions of Article 62 of the Rules: "A name of a Taxonomic group must be rejected if owing to its use with different meanings it becomes a permanent source of confusion or error". The nomenclatorial tangle here presented would constitute a clear case for "nomina specifica conservanda" were such provided for in the Rules.

De Toni (Sacc. Syll. Fung. 7: 484. 1888) first changed the spelling of the specific epithet striaeformis to striiformis. This change can be made under authority of the International Rules, which provide (Recommendation 44) "In the formation of specific epithets composed of two or several roots taken from Latin or Greek, the vowel placed between the two roots becomes a connecting vowel, in Latin i,--." and in Note 2, Article 70, that "The use of a wrong connecting vowel or vowels in a specific epithet is treated as an unintentional orthographic error which may be corrected."

The corrected form has been adopted by the British Mycological Society, the Imperial Bureau of Mycology, the Canadian Plant Disease Survey, appears in Seymour's Host Index of the Fungi of North America, and has been used by various workers here and abroad. It would appear desirable in the interests of establishing uniformity in nomenclature to adopt the corrected form. The accepted binomial for the stripe smut fungus with partial synonymy is therefore as follows:

USTILAGO STRIIFORMIS (West.) Niessl Hedw. 15: 1. 1876.

Uredo striaeformis West. Bull. l'Acad. Roy. Belg. 18: 406. 1852. (The date is often cited as 1851 but 1852 appears to be correct.)
Tilletia striaeformis Sacc. Michelia 1: 8. 1877 [ex errore as T. striaeformis (West.) Niessl].
Tilletia striaeformis Oud. Bot. Zeit. 36: 440-441. 1878.
Tilletia striiformis DeT. in Sacc. Syll. Fung. 7: 484. 1888.

De Toni as cited above was the first to use the corrected spelling for the specific epithet. He credits the combination to Magnus as T. striiformis (West.) Magn. in Winter, Rab. Krypt. Fl. 1: 108. 1884. Winter (l.c.), however, does not credit the new combination, which he indicates by his citation "T. striaeformis (Westd.)", to Magnus, and the natural inference is that the change should be charged to himself, as with many other similar nomenclatorial changes in the same work. He had apparently overlooked the earlier references by Saccardo and Oudemans. De Toni, Ule, and others who have credited Magnus with the name have been in error, therefore, as pointed out by Magnus himself (Abh. Bot. Ver. Prov. Brandenburg 37: 86-88. 1895).

Other specific names which appear to belong to the synonymy ("facultative synonyms") are cited in part. More complete accounts will be found in the works of Liro and Ciferri previously referred to, as well as in Clinton's North American Ustilagineae and in Osner's comprehensive account in his bulletin on Leaf smut of timothy. (Cornell Bull. 381. 1916).

Uredo longissima var. holci Ces. in Kl. Rab. Herb. viv. Myc. 1498. 1850.

The varietal epithet holci is not available under the International Rules for specific use in this case, its priority notwithstanding.

Uredo longissima var. megalospora Riess in Kl.-Rab. Herb. viv. Myc. 1897. 1854.
Tilletia debaryana F. de Wald. in Rab. Fungi eur. 1097. 1866.
Tilletia milii Fckl. Symb. Myc. 1: 40. 1869.
Tilletia alopecurivora Ule Abh. Bot. Ver. Prov. Brandenburg 25: 214. 1884.

Tilletia brizae Ule Abh. Bot. Ver. Prov. Brandenburg 25: 214. 1884.

Ustilago poarum McAlp. Proc. Roy. Soc. Victoria (n. ser.) 7: 220. 1894.

Ustilago washingtoniana Ell. & Ev. Bull. Torr. Bot. Club. 22: 57. 1895.

Tilletia airae-cespitosae Lindr. Acta Soc. pro Fauna et Flora Fennica 26: 15. 1904.

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DIVISION OF MYCOLOGY AND DISEASE SURVEY

NOTES ON VISUAL DIFFERENTIATION OF WHITE PINE BLISTER RUST FROM PINYON RUST IN THE TELIAL STAGE

James W. Kimmey

Cronartium ribicola and C. occidentale, the former an introduced fungus destructive to 5-needle pines and the latter a relatively unimportant native rust on pinyon pines, have been considered morphogically indistinguishable in their uredial and telial stages on ribes, their mutual alternate hosts. These rusts may be physiologically distinguished in their uredial stages by greenhouse inoculations on differential ribes hosts[1], or they may be differentiated in their telial stages by precise laboratory staining methods[2,3]. Either of these methods requires considerable time, and blister rust scouts have desired some method whereby at least a tentative determination could be made directly in the field. Many who have worked with the two rusts have believed they could differentiate between them by appearance in most cases, though they were unable to state exactly what differences guided them in their choice.

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1 Hahn, G. G. A physiological method of distinguishing Cronartium ribicola and C. occidentale in the uredinial stages. Jour. Agr. Res. 40: 105-120. 1930.

2 Acree, R. J., and W. H. Goss. A microchemical colorimetric pH procedure for differentiating the telia of Cronartium ribicola and C. occidentale. Jour. Agr. Res. 55: 347-352. 1937.

3 Cave, M. S. Modification of procedure for differentiating the telia of Cronartium ribicola and C. occidentale. Stain Tech. 19: 141-142. 1944.

During the 1944 field season western blister rust workers, mostly scouts in the sugar pine region of California where the ranges of the two rusts now overlap, sent in nearly 1500 rust specimens to be identified by the laboratory staining methods. While making microchemical determinations of several hundreds of these specimens, and in making comparative tests of known specimens, the writer noted the following five visually recognizable differences that may occur between the two rusts:

1. Telial columns occurring so densely that they form furlike mats are commonly found on leaves bearing C. occidentale. On many specimens bearing C. occidentale the telia do not occur so densely, but those of C. ribicola were never found to form these furlike mats.

2. Columns of mature ungerminated telia of C. occidentale are usually a darker shade of brown than those of C. ribicola. The telial columns of the latter species often have more of an orange tinge. This is only a generality and not a reliable means of identification because many shades of brown are found in both species. Telial columns of either species become dark with great age if not germinated.

3. After telia germinate the columns usually appear faded, but those of C. occidentale have a lavender tinge while those of C. ribicola do not. This is a valuable characteristic in making determinations of specimens that have all or most of the telia germinated. The lavender hue is especially evident in dense mats of C. occidentale columns.

4. The failure of infected leaf areas to produce telia after producing uredia was commonly found in many specimens of C. ribicola, but was relatively rare with C. occidentale specimens. Also necrotic leaf areas where no uredia were produced around infection spots were common on C. ribicola specimens and relatively rare on C. occidentale specimens. Therefore, a specimen with considerable infected leaf area not bearing telial columns is likely to be C. ribicola.

5. It was noted that under light infection conditions (when aecial source is at a considerable distance, which was true of most specimens from the Sierras) where the initial infection, from aeciospores, consists of only one or two spots of rust per leaf, each rust forms rather distinctive patterns in subsequent intensification. The pattern for C. ribicola is characterized by small spots scattered over the leaf surface, whereas, in C. occidentale larger patches or continuous areas occur, as though the initial infection spots had enlarged by greatly extending their margins.